Overshoot likely needed to keep to 1.5C rise by end of century

Description

Could the world still be on track to keep global temperature rise to 1.5C above pre-industrial levels by the end of this century?

Yes, with ambition it could be. But, increasingly, this almost certainly involves some form of ‘overshoot’ where temperature rise exceeds the 1.5C threshold before coming back down nearer the end of the century. If this happens there are several apposite questions, including: the duration of any overshoot; how far above 1.5C any overshoot could be; and consideration of what the wider environmental impacts could be.

Any overshoot of 1.5C above pre-industrial levels will place increasing stress on parts of the environment, including the cryosphere, such as here in Antarctica. Picture: Shutterstock.

On Monday 4 April, the IPCC will be publishing the third part of its AR6 assessment – the most complete review of climate science in nearly a decade. Working Group III will present the scientific evidence around mitigation – the considerations about how to avert the worst impacts of climate change by slowing the rate of greenhouse gas emissions, and even removing the greenhouse gases from the atmosphere which are causing the planet’s temperature to rise.

Dr Andy Wiltshire is the Met Office Head of Earth System and Mitigation Science. He said: “According to the IPCC’s latest assessment, the earth’s temperature is around 1.1C above pre-industrial levels – generally recognised as the period between 1850 and 1900. This really doesn’t give us muchheadroom to avoid breaking one of the Paris Agreement ambitions of not exceeding 1.5C.

“At COP26 in Glasgow, last November, countries updated their individual pledges to curb greenhouse gas emissions. When totted up these pledges – known as Nationally Determined Contributions (NDCs) – take us a certain way towards averting the worst impacts of climate change, but analysis shows barely a chance that any of the current climate change scenarios will get us to a point where we can prevent peaking above 1.5C for a period of time without more urgent and immediate action.”

Andy and his team have been working on an academic paper using scenarios prepared by the IPCC for its SR1.5 report in 2018. Andy added: “Our study reveals that it is extremely difficult to find a scenario consistent with the CoP26 pledges that can keep the world from rising above 1.5C with confidence. In this set of scenarios, meeting the COP26 pledges likely implies an overshoot of 30 to 70 years, reaching an average value of around 1.7C before coming back down to around 1.5C at the end of the century.”

Although feasible, the overshoot trajectories come with added risks for climate impacts along with the apparent optimism. These include:

- **Reliance on technologies untested at scale:**
  It relies on more aggressive action to tackle atmospheric greenhouse gas concentrations to help bend the curve downwards after the temperature peak. Increasingly this is likely to require the use of technologies to ‘suck’ extra greenhouse gases out of the atmosphere; If the greenhouse gas removal can’t be scaled the world will stay above 1.5C for longer.
- **Commitment to higher long-term climate risks:**
  By the end of the century sea levels will have risen more than without an overshoot because of the period of enhanced warming. Additionally, the Cryosphere – the ice world – will have lost even more volume due to the higher temperatures. Furthermore, some impacts, such as loss of species, will be irreversible.
- **Exposure to a greater chance of passing key climate tipping points:**
  Whilst we don’t know the precise trigger points for large-scale climate tipping points even a temporary incursion above 1.5C will take us closer to thresholds which could initiate tipping points.

Prof Jason Lowe OBE is the Head of Climate Services at the Met Office Hadley Centre. He said: “Tackling climate change is ultimately about trying to prevent every fraction of a degree rise in the earth’s global temperature, and adapting to the fraction of warming that is unavoidable. Every delay in reducing emissions increases the risks from climate impacts and increases the reliance on technologies for enhanced carbon-dioxide removal that remain unproven at a large-scale.

“There is reason to be optimistic. Pledges made during CoP26 have further bent the curve downwards and the ratcheting mechanisms under the Paris Agreement are taking effect. “However, we are increasingly looking to a future where we will have to actively remove the greenhouses gases that we currently emit into the atmosphere if we want a 1.5C warming limit.”

The Working Group III report will provide further insight into the range of options available to reduce emissions, including their costs and feasibility at scale. It will also help us further understand how to develop climate resilient development pathways that consider mitigation, adaptation and other societal development needs in a more holistic way.

Andy Wiltshire concluded: “Emission reductions are inescapable if we are to avoid the worst impacts from climate change. Every year delay in reaching peak emissions increasingly commits future generations to a technological solution that is currently untested at the scale that will be required.”

Met Office science increasingly focuses on making a resilient net zero future a reality. Our expertise can improve the deployment and operation of renewable energy generation. Our ability to simulate the earth system provides tools that can help us better work with the natural system to take up carbon, methane and other greenhouse gases. Our observational datasets can help us monitor progress towards a net zero future, with our inversion-monitoring approach helping to identify emission sources.

Date Created
April 2022

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Met Office and Stories with Symbols link up on learning resources

Description

The Met Office has linked up with children's charity Stories with Symbols to help produce learning resources on weather and climate for children with special educational needs.

Stories with Symbols is a charity that creates videos for children with additional speech, language and communication needs, and recently visited the Met Office to create a series of accessible videos on weather and climate.

It's hoped the videos will be used by specialist schools around the country, as well as by parents and children at home, to help make what can be quite a complex subject into something that is simple and easy to understand.

Co-founder of Stories with Symbols Alex Rowe said: "From the ground up, our videos are designed with our audience of children with additional needs in mind. We're able to allow for extra processing time through the pace of speech in our videos. We also embrace and employ a wide range of communications tools, such as on-screen symbols, facial expressions, props and gestures, all to help convey the key meaning to our young learners.

"We know that our existing videos are used by children at home, in schools and by therapists as part of programmes of support. These new videos are for an audience of slightly older children, for whom it can be a struggle to source accessible material which both meets their needs and respects their maturing interests.

"The Met Office was really enthusiastic right from the start and immediately recognised in our project its goal to communicate about weather and climate to a more diverse audience. Being able to film at the Met Office and speak to a real climate scientist gave us an opportunity to link the topics from the books in our videos to a real, relevant, place."

> The first Stories with Symbols video, aimed to help young people with special educational needs learn more about the weather.

Stories with Symbols started as a way to communicate story books to children with special educational

needs, but the link up with the Met Office is part of a move into educational features on different subject areas.

Alex Rowe added: “The topics of weather and climate have never been more relevant, so we’re really excited about engaging a more diverse range of children in the discussion. It’s something that affects all of us and we believe it’s a subject many children are curious to learn more about, whether they have additional needs or not.”

The Met Office also produces a range of free resources for schools around learning about weather, climate and climate change. This has helped hundreds of young people understand the impacts of weather and climate change locally and globally, for people, places and businesses.

Met Office Learning Consultant Rosanna Amato, who features in the videos with Stories with Symbols, said: “It has been absolutely fantastic to work with Stories with Symbols and contribute to their mission of creating these learning resources for young people with special educational needs.

“Everyone deserves to be able to learn about weather and climate, and I’m thrilled we’ve been able to play a small role in helping communicate some of our Met Office science to the Stories with Symbols audience.

“We have also gained some great insights into how we can share complex climate science messages in a simple and engaging way, which will help the Met Office as we continue to develop educational resources for a more diverse audience in the coming years.”

The first video is available now on the Stories with Symbols YouTube page, with further videos set to be released in the coming months.

Find out more about Stories with Symbols on YouTube and on the Stories with Symbols website.

Explore the Met Office’s range of education resources for schools and educators.

Date Created
April 2022

Sir Patrick Vallance highlights the ‘trusted’ voices of climate science

Description

In a hearing of the House of Lords Environment and Climate Change Committee yesterday [26 April, 2022] Sir Patrick Vallance – the Government Chief Scientist – indicated the role and trust of climate science in helping achieve climate targets.

Sir Patrick Vallance highlighting the value of climate science in the Science Pavilion (jointly hosted by the Met Office) at COP26 in Glasgow in November, 2021. Picture: Grahame Madge, Met Office

He said: “I think there needs to be clear, consistent messaging. And if you look at the data from the public, they do trust scientists and therefore, climate scientists and others who can comment on this are trusted voices in this space and can give neutral policy, independent science advice, which I think is helpful.”

Talking about the individual measures which will be required to help meet climate targets, Sir Patrick added: “One of the problems is that the individual actions appear trivial. You know, I’m going to cycle a bit more. I’m going to eat a bit less meat, I’m going to fly less. But aggregated across entirepopulations, they make a big difference. And so making sure that people understand what they can doas individuals is an important part of this.”

Recognising the need for the public to be ‘enabled’ to make climate-friendly choices, Sir Patrick added: “Cycling is easier if you’ve got an infrastructure to cycle on. It requires reducing what Bill Gates has called the green premium. If it costs you ten times more to do something, it’s very difficult for people to do. And therefore, really working on reducing that cost and making the affordability work and making sure that regulation and barriers are removed and regulation is in the right place to drive behaviours in that way. So I think there’s a series of levers that need to be looked at rather than thinking this is a dramatic, sudden, all society big change. I mean it’s a series of things that need to take place.”

View the full House of Lords Environment and Climate Change Committee session with Sir Patrick Vallance.

Date Created
April 2022

What’s the weather outlook for the bank holiday weekend?

Description

There will still be a good deal of dry weather around through the weekend, with many places seeing the sun at times.

After what has been a mild and settled week for many, there’s a signal for some brief interludes of showery rain during the bank holiday weekend, although the details are still being determined.

High pressure has been sitting over the UK for much of the week, bringing a good deal of dry, fine weather and some sunny spells.

Although the bank holiday weekend will continue that theme for many, the chance of rain increases as a band of showers and cloudier skies move in from the northwest by the end of Saturday. The precise extent of how this band of rain moves southeast over the UK during Saturday night and Sunday is still uncertain, with forecasting models producing a number of alternate scenarios – but broadly the further north and west you are, the more likely to see some rain.

Despite the chance of showers in some areas, there will still be a good deal of dry weather around through the weekend, many places also seeing the sun at times.

Alex Deakin presents the 10 day trend

On the whole, bank holiday Monday should see plenty of dry weather for the UK, with only the odd isolated light shower, although the far north of Scotland could see some more persistent rain, depending on how the weekend's weather develops.

Met Office Deputy Chief Meteorologist Rebekah Sherwin said: "It's an interesting set-up for the weekend's weather after what has been a fine, dry and settled week for most.

"Although there's plenty of detail to be resolved in the coming days, there will still be a good deal of dry weather in the bank holiday weekend, albeit with some rain spreading in from the northwest on Saturday and Sunday. The uncertainty at the moment is how far this rain might stretch towards the southeast on Sunday, but the further southeast you are the more likely you are to stay dry. Most places should also see some sunny spells on one day or the other during the weekend.

"The set-up for next week is for that largely settled theme to continue, with brief incursions of showers and temperatures most likely staying around average for early May."

You can check the latest forecast on our website, or by following us on Twitter and Facebook, as well as on our mobile app which is available for iPhone from the App store and for Android from the Google Play store.

Date Created
April 2022

Is the glossy ibis about to spread its wings to colonise the UK?

Description

A range of climate factors are in alignment that could help the UK make wildlife history this spring and summer.

Extremely dry conditions in southern Iberia and a relatively higher mean winter temperature over the UK has encouraged large number of glossy ibis – a distant relative of storks and herons – to spend the winter here. It is thought possible that this could lead to the first nesting in the UK of a wetland bird that in Europe is found mainly in the Mediterranean.

A group of glossy ibis in Devon this winter at the RSPB's Exminster Marshes reserve in Devon. Picture: Stuart Webster.

Malcolm Ausden is an ecologist with the RSPB. He recently co-authored a paper on the prospects of the glossy ibis nesting for the first time in the UK. He said: "The glossy ibis is a bird which is largely found in extensive wetlands in warmer climes. It is one of the world's most widespread birds, being found from southern and eastern Europe through central and southern Asia to Australia, across Africa and also in the Atlantic and Caribbean region of the Americas.

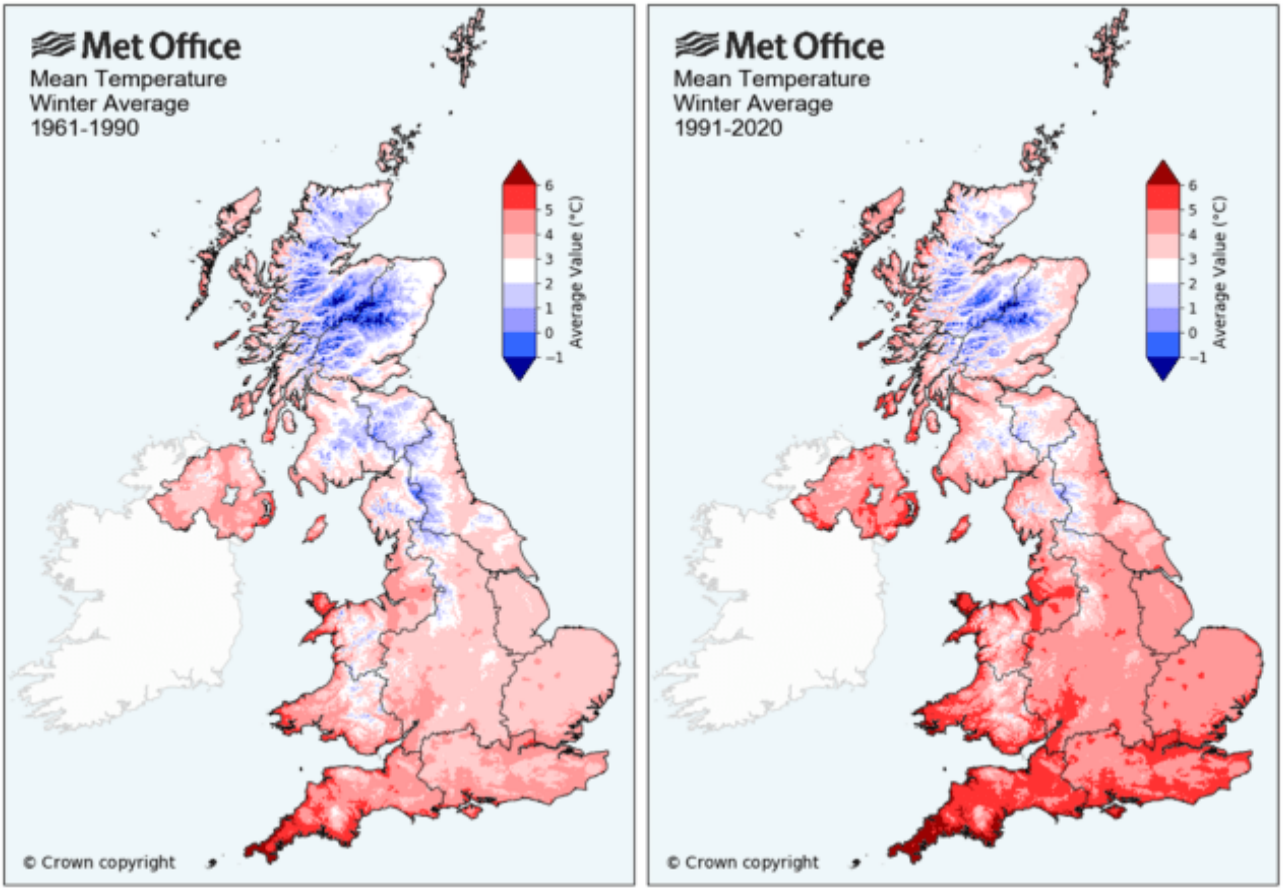
"In common with a number of wetland birds the glossy ibis has to be able to cope with occasional periods of drought and this strategy may force a shift to new locations should existing areas become

unsuitable. In fact, the glossy ibis did make a leap across the Atlantic, colonising the warmer parts of the Americas from the 19th Century onwards. So this species has a proven track record of colonising new areas far from its traditional breeding grounds.

“Weather conditions in Spain were extremely dry last winter and this encouraged a large number of glossy ibises to disperse north to the UK where they encountered milder-than-average winter conditions. Glossy ibises are unable to survive prolonged periods of cold weather. We still have large numbers of glossy ibises across the UK and if they remain here they may well see the UK as a good place to nest.”

Grahame Madge is a climate spokesman for the Met Office, as well as being a keen birdwatcher. He said: “Within my lifetime I have seen notable changes in the UK’s birdlife with several species now nesting in the UK which were formerly extremely rare visitors. A few years ago it may have been deemed fanciful to think that a bird more associated with the Mediterranean could begin to nest in the UK. Over the last couple of decades little, cattle and great white egrets have all started to nest in the UK and now there is an indication that the glossy ibis may join the growing list. If it doesn’t happen this summer, then many believe it is surely only a matter of time.

“Although it is tempting to speculate about which species may arrive in the UK, many of our traditional species are losing out in, especially in southern England, as their ranges shift further north.”

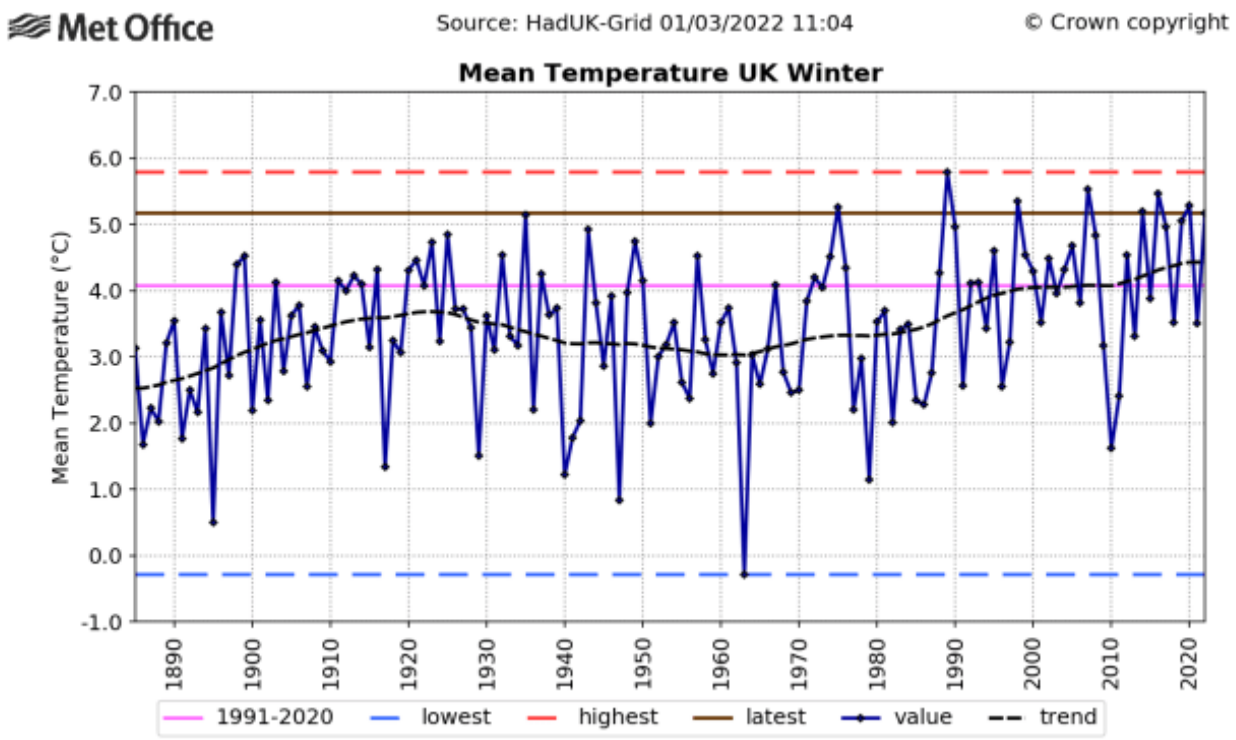


The average winter temperature in the UK over the last 60 years has increased.

Dr Mark McCarthy is the head of the Met Office’s National Climate Information Centre. He said: “UK

temperature has risen by close to 1C in the last 60 years as a consequence of global climate change. We see this across all seasons, and for the 30-year period between 1961-1990 the mean winter temperature was 3.3°C. By 1991 to 2020 the 30-year average winter temperature had risen to 4.1°C. One consequence of our changing climate is that it is already influencing the range of some of the flora and fauna that can make their home here."

The mean temperature for the UK in Winter 2022 was 5.2°C, more than 1.0°C above the long-term average for the last 30 years.



The UK winter mean temperature has increased by more than 1.0C since the mid 1960s.

Date Created
April 2022

Why has April been so dry?

Description

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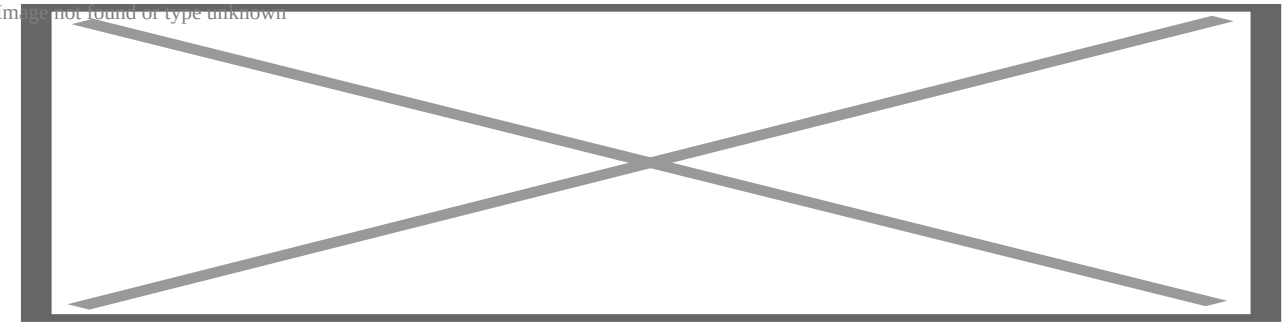
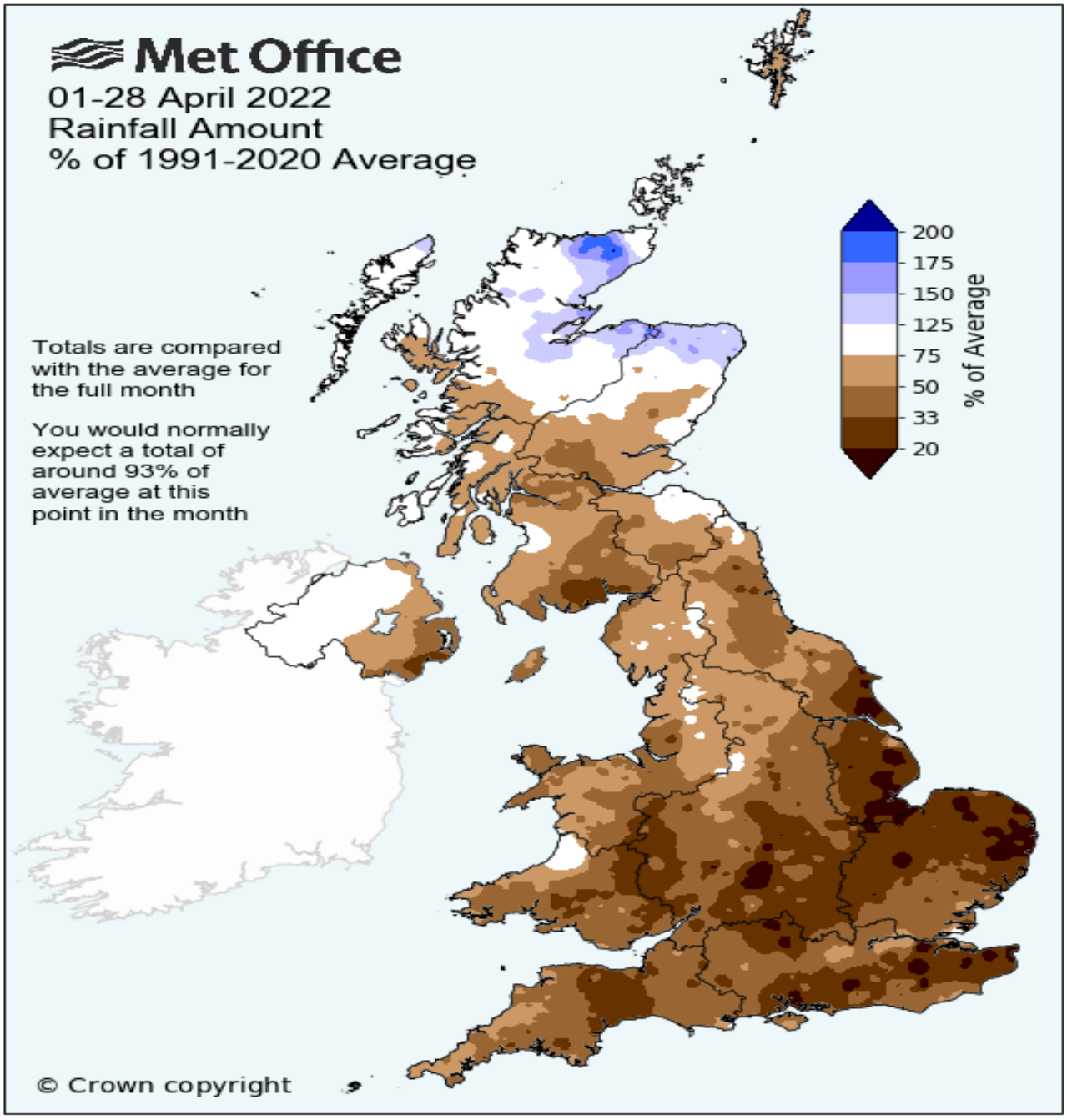


‘April showers’ have been in short supply this month for the UK, but just how dry has it been and why?

April 2022 has been predominantly settled so far. High-pressure has influenced the weather for much of the month, blocking rain-bearing Atlantic frontal systems and killing off any showers, though its effects have not been spread evenly. Low-pressure systems brought some wet days early on, especially across Scotland and Northern Ireland.

Dr Mark McCarthy of the National Climate Information Centre said: “What we’ve seen this month is a long period of time with the UK under the influence of high pressure, bringing calm and settled weather, especially in the south.

“Early in the month, the Azores High dominated the weather in the south, with low-pressure systems continuing to make some progress in northern areas. Later in the month high-pressure remained dominant, but this time centred more towards Scandinavia or Iceland, and this week over the UK itself. What this adds up to is a dry theme for the month, with scattered showers making limited impacts in northern areas.”



April's rainfall between 1 April and 28 April, compared to the meteorological average for the month.

With a couple of days left of April, it has been a dry month across all regions of the UK, although most pronounced in the south. Up to 28 April, which is the latest provisional data that is available, you'd expect to have seen 93% of the average rainfall within the month, but currently for the UK, it's at just 61% (43.7mm). Much of southern and eastern England has so far received only around a third of the monthly average rainfall, with a few locations in eastern England less than a fifth of normal.

England has so far seen 41% of its average (23.2mm), Wales 46% (40.7mm), Scotland 82% (76.4mm) and Northern Ireland 78% (57.9mm). The only areas that have been wetter than average are to be

found in the north of Scotland, although the west of Northern Ireland has also had near-average rainfall.

Historically speaking, the dryness seen so far in April isn't set to break any records and has not been as dry as April 2021, especially with some rain showers expected before the end of the month. You'd have to go back to 1842 to find the driest April on record, when an average of just 11.3mm of rain fell.

This April's dryness continues a marked run of dry Aprils in recent years, with an average of just 20.6mm of rain falling in 2021, and 30mm in 2020. April 2019 saw similar levels of dryness to this year, with an average of 48.6mm falling in the month.

There is still some room for manoeuvre in the rainfall statistics, with some showers expected through the weekend.

Near-average picture elsewhere

The full statistics for April's weather will be published on 3 May, but the indications up to 28 April suggest a near-average picture for much of the other national statistics for the UK.

Average maximum temperatures for the month so far stands at 12.5C, which is 0.5C above average. Minimum temperatures have been fairly close to average for the UK, standing at 3.6C, which is 0.2C lower than the average. There were some notably cold nights early in the month, with a hard frost on 3 April across southern England as temperatures fell to -4.9C at Wisley, Surrey and at Yeovilton, Somerset.

Sunshine levels are around what you'd expect for this time of the month, with an average of 153 hours so far (98% of the average for the whole month). Compared to average, the brighter areas have been found in the east, despite some recent cloud and fog, while northern areas of Scotland have been lagging slightly behind their average sunshine figures.

The full month's weather and climate statistics will be released on 3 May.

Averages are determined by the 1991-2020 meteorological averaging period.

Date Created
April 2022